



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,546	07/25/2003	Hardayal Singh Gill	HITG.031PA(0594)	3605

7590 05/03/2006  
Chambliss, Bahner & Stophel, P.C.  
Two Union Square  
1000 Tallan Building  
Chattanooga, TN 37402

EXAMINER

TUGBANG, ANTHONY D

ART UNIT	PAPER NUMBER
----------	--------------

3729

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/627,546	<b>Applicant(s)</b> GILL, HARDAYAL SINGH	
	<b>Examiner</b> A. Dexter Tugbang	<b>Art Unit</b> 3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 2-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 6-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Election/Restrictions*

1. The applicant(s) election without traverse of the invention of Group II, Claims 6 and 7, in the reply filed on March 3, 2006 is acknowledged.

2. Claims 2-5 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in the reply filed on March 3, 2006.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Gill 6,407,890, referred to hereinafter as Gill'890.

Gill'890 discloses a method of forming a spin valve sensor comprising: forming a first pinned layer (e.g. 220) having a first magnetic orientation (e.g. 236) and a first width (in Fig. 12); forming a second pinned layer (e.g. 222) having a second magnetic orientation (e.g. 238) anti-parallel to the first magnetic orientation (see col. 6, lines 15-20); and forming a sensing layer (e.g. anyone of layers 208, 240, 210 or 212) with a second width smaller than the first width. It is noted that the second width is smaller than the first width due to the slope formed on the outer

Art Unit: 3729

edge surfaces of the all the layers (in Fig. 12). The slope (e.g. 138, 140) is also shown in Figure 11.

Regarding Claim(s) 11, Gill (in Fig. 11) further teaches forming insulating layers (e.g. 148, 150) on both sides of the sensing layer.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gill'890 in view of Gill 6,271,997, referred to hereinafter as Gill'997.

Gill'890 discloses the claimed manufacturing method as relied upon above in Claim 1, further including: forming a free layer (e.g. 208) having a third magnetic orientation (e.g. 209) orthogonal to the first and second magnetic orientations; forming a bias layer (e.g. 212 or 210) in proximity to the free layer having a fourth magnetic orientation; and forming an AFM layer (e.g. 240) adjacent the bias layer, wherein the exchange coupling between the AFM layer and the bias layer sets the fourth magnetic orientation.

Gill'890 does not teach that the fourth magnetic orientation of the bias layer is anti-parallel to the third magnetic orientation of the free layer.

Gill'997 shows a bias layer (e.g. 222 or 218 in Fig. 12) having a magnetic orientation (e.g. 232 or 230) that is anti-parallel to the magnetic orientation of the free layer (e.g. 220) where

Art Unit: 3729

this anti-parallel magnetic orientation between the free layer and the bias layer produces a desirable low net magnetic moment that is highly responsive to signal fields from the magnetic disk (see col. 10, lines 3-21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Gill'880 by having the fourth magnetic orientation of the bias layer be anti-parallel to the third magnetic orientation of the free layer, as taught by Gill'997, to advantageously allow a desirable low net magnetic moment that is highly responsive to signal fields from the magnetic disk.

Regarding Claim(s) 7, the relative thickness between the bias layer and the free layer is considered to be an effective variable within the level of ordinary skill in the art of manufacturing spin valves. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the bias layer with a thickness greater than the thickness of the free layer, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

7. Claims 8, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gill'890 in view of Mauri 5,768,069.

Gill'890 discloses a method of manufacturing a spin valve as relied upon above in Claim 1.

Regarding Claim(s) 9, Gill'890 further teaches forming insulating layers (e.g. 148, 150) on both sides of the sensing layer.

Gill'890 does not teach: 1) that the second pinned layer has a width substantially equal to the second width of the sensor layer (as required by Claim 8); and 2) that the second pinned layer has a width that is substantially equal to the first width of the first pinned layer (as required in Claim 10).

Mauri shows that a spin valve can be manufactured having all of the pinned layers (e.g. 572, 546, 578) being of equal width, as well as having anyone of the pinned layers with a width that is equal to the width of the sensor layer (e.g. free layer 552 in Fig. 5), to produce an art recognized equivalent spin valve sensor.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Gill'890 by having the second pinned layer with a width that is equal to the second width of the sensor layer, as well as having the second pinned layer with a width that is equal to the first width of the first pinned layer, as taught by Mauri, to produce an art recognized equivalent spin valve sensor.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

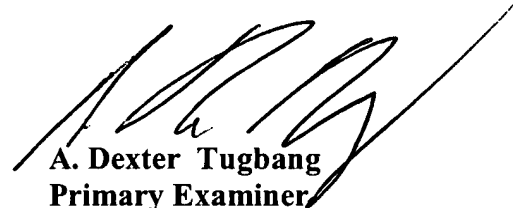
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 571-272-4570.

The examiner can normally be reached on Monday - Friday 8:30 am - 5:00 pm.

Art Unit: 3729

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**A. Dexter Tugbang**  
**Primary Examiner**  
**Art Unit 3729**

May 1, 2006